

Application Serial No: 10/712,770  
Responsive to the Office Action mailed on: December 17, 2007

### REMARKS

This Amendment is in response to the Office Action mailed on December 17, 2007. Claims 3 and 29 are amended. Claim 3 is amended editorially and is supported, for example, in the specification on page 7, line 25-page 8, line 2 and page 8, lines 21-33. Claim 29 is amended editorially and is supported, for example, in the specification on page 7, line 25-page 8, line 2 and page 15, line 26-page 16, line 8. No new matter is added. Claims 3-16, 18-24, 29-32 and 36 are pending.

#### §103 Rejections:

Claims 3-12, 14-16, 29-32 and 36 are rejected as being unpatentable over Iizuka (US Patent No. 6,686,960) in view of Ikeda (US Patent No. 6,423,959). This rejection is traversed.

In general a solid-state image sensing device conducts a first operation of reading out signal charges from pixels to vertical transfer parts; a second operation of vertically transferring the read out signal charges in the vertical transfer parts; a third operation of a horizontal transfer part receiving the signal charges from the vertical transfer parts; and a fourth operation of horizontally transferring the received signal charges in the horizontal transfer part.

Claim 3 is directed to a solid-state image sensing device that requires, among other features, signal charges of pixels included in each of first and second pixel mixture groups are added together in the horizontal transfer part. The first pixel mixture groups each are composed of  $2n+1$  ( $n$  denotes an integer of 1 or higher) pixels arranged at every other pixel in a horizontal direction of the bidimensionally arranged pixels, and the second pixel mixture groups each are composed of  $2n+1$  pixels that are arranged at every other pixel and are pixels other than those of the first pixel mixture groups in the horizontal direction of the bidimensionally arranged pixels, with centers of gravity of the pixels of the respective second pixel mixture groups each being located at an equal distance from centers of gravity of the pixels of two first pixel mixture groups adjacent thereto. An advantage of  $2n+1$  pixels arranged at every other pixel in a horizontal direction is that the formation of moiré and aliasing is avoided.

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The combination of Iizuka and Ikeda does not teach or suggest these features. The above mentioned features of claim 3 relate generally to the third operation of a horizontal transfer part receiving the signal charges from the vertical transfer parts and the fourth operation of horizontally transferring the received signal charges in the horizontal transfer part (i.e., arranging charges in the horizontal transfer part). In contrast, Figure 16 of Ikeda, relied upon by the current rejection as teaching first and second pixel mixture groups, each containing  $2n+1$  pixels, merely teaches photoelectric converters (3) composed of charge ranging from  $y_{n+7}$  to  $y_n$  and arranged in a vertical direction (see column 19, lines 3-27 and Figures 16 and 17 of Ikeda). Thus, charge ranging from  $y_{n+7}$  to  $y_n$  is directed generally to the first operation of reading out signal charges from pixels to vertical transfer parts and the second operation of vertically transferring the read out signal charges in the vertical transfer parts (i.e., arranging charges in the vertical transfer parts). Nowhere does Ikeda teach or suggest how charges are arranged in the horizontal transfer part. Iizuka does not overcome these deficiencies of Ikeda as Iizuka is also silent as to how charges are arranged in the horizontal transfer part.

Also, a configuration of charges in the vertical transfer parts is not relevant to a configuration of charges in the horizontal transfer part and it is not possible to arrange charge particles in the horizontal transfer part prior to arranging the charge particles in the vertical transfer parts as the first through fourth operations must be performed in order. Accordingly, Ikeda also provides no motivation to modify Iizuka to teach that signal charges of pixels included in each of first and second pixel mixture groups are added together in the horizontal transfer part, where the first pixel mixture groups each are composed of  $2n+1$  ( $n$  denotes an integer of 1 or higher) pixels arranged at every other pixel in a horizontal direction, and the second pixel mixture groups each are composed of  $2n+1$  pixels that are arranged at every other pixel and are pixels other than those of the first pixel mixture groups. For at least these reasons claim 3 is not suggested by the combination of Iizuka and Ikeda and should be allowed. Claims 4-12 and 14-16 depend from claim 3 and should be allowable for at least the same reasons.

Claim 29 is directed to a solid-state image sensing device that requires, among other features, an operation mode that can be switched selectively between at least two

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modes including a mode of mixing  $m_1$  pixels arranged horizontally of the bidimensionally arranged pixels and a mode of mixing  $m_2$  pixels arranged horizontally of the bidimensionally arranged pixels, where the integer  $m$  indicates a common multiple of  $m_1$  ( $m_1$  denotes an integer of 2 or higher) and  $m_2$  ( $m_2$  denotes an integer of 2 or higher).

The combination of Iizuka and Ikeda does not teach or suggest these features. The above mentioned features of claim 29 relate to the third operation of a horizontal transfer part receiving the signal charges from the vertical transfer parts and the fourth operation of horizontally transferring the received signal charges in the horizontal transfer part (i.e., arranging charges in the horizontal transfer part). In contrast, Figures 12 and 14 of Ikeda, relied upon by the current rejection as teaching at least two modes including a mode of mixing  $m_1$  pixels arranged horizontally and a mode of mixing  $m_2$  pixels arranged horizontally, merely teach a mode in which charge arranged in a vertical direction is mixed together. Thus, charge ranging from  $y_{n+7}$  to  $y_n$  is directed to the first operation of reading out signal charges from pixels to vertical transfer parts and the second operation of vertically transferring the read out signal charges in the vertical transfer parts (i.e., arranging charges in the vertical transfer parts). Nowhere does Ikeda teach or suggest a mode of mixing  $m_1$  pixels arranged horizontally and a mode of mixing  $m_2$  pixels arranged horizontally as Ikeda is silent as to how charges are arranged in the horizontal transfer part. Iizuka does not overcome these deficiencies of Ikeda as Iizuka is also silent as to how charges are arranged in the horizontal transfer part.

Claim 13 is rejected as being unpatentable over Iizuka in view of Ikeda and further in view of Uya (US Patent No. 7,199,826). This rejection is traversed. Claim 13 depends from claim 3 and is allowable for at least the same reasons discussed above. Applicants do not concede the correctness of this rejection.

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Conclusion:

Applicants respectfully assert that claims 3-16, 18-24, 29-32 and 36 are in condition for allowance. If a telephone conference would be helpful in resolving any issues concerning this communication, please contact Applicants' primary attorney-of record, Douglas P. Mueller (Reg. No. 30,300), at (612) 455-3804.



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